

Turning to individual courtship patterns, the behaviour of ibex, markhor, domestic goat, and wild goat is again alike, although slight differences exist in the execution of several displays. Rutting male goats may fold their tails over their rumps. Domestic goats differ from wild species in that both males and females often carry their tails raised horizontally or vertically even when not sexually active. Both domestic and wild forms nuzzle penises, insert penises into the mouth, and spray forelegs and heads with urine. A *Capra* male regardless of species also sniffs the perineal areas of females, stimulating the animals to urinate, then checks the urine before raising his muzzle with the lip curled up. Markhor, ibex, and wild goat males often wait until after the female has urinated before sniffing the fluid on the ground, in contrast to the domestic goat males studied by SHANK (1972) which usually let the females urinate directly into their mouths. Specific differences in the head movements of lip-curling males possibly exist. A wild goat male tends to keep his head motionless, whereas an ibex and markhor male may wave it from side to side, and in the latter species, also abruptly up and down.

Lowstretching, twisting, kicking, tongue-flicking, and wickering are probably found in all *Capra*, for not only do these patterns occur in the four kinds under discussion but also in the tur (*Capra caucasica*) according to STEINHAUF (1959) and WALTHER (1961). Wild goats execute the lowstretch rather quickly, and, on the whole, the display is not elaborate. A male ibex, on the other hand, may just stand by a female in a lowstretch. The lowstretch of markhor appears to be less cursory than that of wild goat but not as prolonged as that of ibex. Wild goat and markhor kick stiffly, the foreleg held straight, whereas ibex paw the air with the carpal hanging limply. SHANK (1972) noted that the domestic goats he observed kick stiffly but with the foreleg bent. We have seen domestic goats kick with a straight leg, indicating that breed or population differences may exist. These displays have not been studied quantitatively except in ibex and wild goat. Leaving out tongue-flicking and wickering, AESCHBACHER (in press) recorded 3786 displays among ibex of which 11 % were lowstretches, 45 % were twists, and 44 % were kicks. The comparable percentages for wild goat were 13, 59, and 28. Wild goats twisted more and kicked less than ibex, but these differences have possibly little significance because the ibex data were obtained from a small captive herd.

The various goats differ greatly in their use of lateral displays. The head-up of wild goat has also been described for domestic goat and markhor, but not for ibex. An erect posture with chin tucked in is found both in wild goat and markhor, but SHANK (1972) does not mention it for domestic goat. It is also absent from the repertoire of ibex, and in fact, WALTHER (1961) noted that ibex seem to lack all lateral displays. The headdown of wild goat has not been described for the three other kinds of goat, although a display resembling it occurs in tahr (*Hemitragus*), which are primitive caprids, as well as in some rupicaprids. For example, the mountain goat (*Oreamnos americanus*) may display itself broadside to an opponent while walking stiffly with back hunched and neck arched far down (GEIST 1965). The Nilgiri tahr (*Hemitragus hylocrius*) employs a similar posture (SCHALLER 1970).

Since most *Capra* and related genera have not been studied in detail, it is difficult to evaluate the similarities and differences in behaviour found among the four kinds of goat described here. Except for the head-down display, the behaviour of rutting markhor and wild goat is alike, more so even than that of wild goat and domestic goat. After at least 8500 years of domestication (REED 1959), during which social and environmental pressures on the animals have been quite different from those acting on wild forms, it is not surprising that the behaviour of domestic goats has changed somewhat from that found in their probable progenitors. Besides differences in the

behaviour of domestic breeds are likely to occur, just as there are minor display differences between subspecies of ibex (see WALTHER 1961). Some domestic breeds may well resemble wild goats more in their behaviour than the animals observed by SHANK (1972). The ibex differs most from the other kinds of goats, particularly in its lack of lateral displays, suggesting that this species has had a longer period of independent evolution than, for instance, wild goat and markhor.

Zusammenfassung

Das Brunftverhalten der Bezoarziege

Das Brunftverhalten der Bezoarziege wurde während des Monats September 1972 in Pakistan studiert. Die Herden umfassen bis zu 100 Individuen; im Mittel waren es 22 Tiere pro Herde. Hierbei waren Männchen und Weibchen in ungefähr gleich großen Zahlen vertreten. Kämpfe der Männchen um brunftige Weibchen waren auf Grund der Rangordnung der Männchen selten. Dominanz ist hauptsächlich vom Besitz von Rangabzeichen, wie der Länge der Hörner, abhängig. Verschiedene Elemente des Brunftverhaltens werden beschrieben und quantitativ erfaßt. Erwachsene Männchen werben um Weibchen mindestens zweimal so häufig wie junge. Die Folgen des Werbeverhaltens wurden gegen Höhepunkt der Brunft länger und stiegen von 1.0 bis 7.9 Elementen des Werbeverhaltens pro Sequenz.

Das Brunftverhalten der Bezoarziege ist dem der Schraubenziege, des Alpensteinwildes und der Hausziege mit den Verhaltenselementen der Streckhaltung, des Laufschlagens und des Kopfdrehens, die bei allen 4 Formen vorkommen, ähnlich. Geringfügige Verhaltensunterschiede bestehen jedoch; auf sie wird hingewiesen. Ein wesentlicher Unterschied liegt im Vorhandensein bzw. Fehlen des Breitseit-Imponierens. Am ähnlichsten sind sich in ihrem Brunftverhalten Bezoarziege und Schraubenziege, der Steinbock weicht von den anderen Formen am meisten ab.

Summary

The courtship behaviour of wild goat was studied in Pakistan during September, 1972. Herds contained up to 100 members with an average of 22, males and females being present in about equal number. Fighting between males in competition for estrous females was rare because males had a hierarchy. Dominance was mainly based on the possession of status symbols such as horn length. Various aspects of courtship behavior are described and quantified. Adult males displayed to females proportionately at least twice as often as young males. Display sequences of courting males became longer as the rut approached its peak, increasing from 1.0 displays per sequence to 7.9.

The courtship behaviour of wild goat is similar to that of markhor, Alpine ibex, and domestic goat, with, for example, displays such as the lowstretch, kick, and twist being present in all 4 forms. However, minor behavioural differences do exist, and these are pointed out. A major difference is in the presence or absence of various lateral displays. In general, wild goat and markhor are most similar in their courtship behaviour and ibex differ most from the other three kinds of goat.

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Literature

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